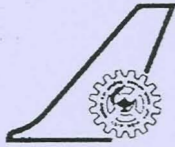


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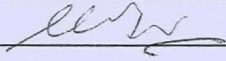
Documentation Sheet

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LABORATORIES****Class : - Classified
No. of Copies: 15****Title:** Aero-Thermodynamic Modelling and Gas Path Simulation for a Twin Spool Turbo Jet Engine**Author/s:** Balaji Sankar, Thennavarajan. S, V Vijayendranath, Brijeshkumar Shah, Ashfaque A Khan, Soumendu Jana, S. Ramamurthy (Hon. Consultant)**Division :** PROPULSION DIVISION

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Engine simulation model / virtual engine building is one of the important aspects towards development of Engine health management system. In the present work, an attempt has been made to develop simulation model for a typical twin spool turbo jet engine using commercially available Gas turbine Simulation Program (GSP). The engine simulation model has been used for aero-thermodynamic gas path performance analysis related to engine run at design point (ISA conditions), off design points (test-bed ambient condition) and Acceleration-Deceleration Cycles (ADC) at ISA conditions. Simulation results have been compared with sample test bed data for the purpose of validation. This document describes in detail the procedure for engine simulation model development using GSP. Predicted results show good correlation with experimental test-bed data. The engine simulation model can further be used to simulate several fault conditions leading to data generation required for engine health management system development. This work has been carried out as a part of NPMASS sponsored project entitled Aero Engine Health Management.